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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,145	07/25/2003	Jameson R. Forte	8540G-000086/COB (GP-3013	2529

27572 7590 09/29/2005

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EXAMINER	
CREPEAU, JONATHAN	
ART UNIT	PAPER NUMBER
1746	

DATE MAILED: 09/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/627,145	FORTE ET AL.	
	Examiner	Art Unit	
	Jonathan S. Crepeau	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8-8-05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1-9. The claims are newly rejected under 35 USC 103 and 35 USC 112, as necessitated by amendment. Accordingly, this action is made final.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1 and 6 have been amended to recite "up to about 10°C above the dew point of water." However, this limitation is not supported by the originally filed application, and furthermore, raises an enablement issue. In paragraph 58 of the specification, it is disclosed that "preferably the temperature of the wet gas stream [...] is maintained at a temperature above the dew point of the gas." As such, it is clear that the dew point limitation refers to the dew point of the gas. Furthermore, it is submitted that the new language is not enabled because by definition,

the term "dew point" refers to a gas and not a condensable component such as water. Correction is required.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 6 have been amended to recite "and the other end of said conduit is connected to said device supply stream output." The limitation "said device supply stream output" lacks antecedent basis. It is submitted that the limitation is also improper because the device supply stream flows *around* the conduits, not through them, as shown in Figure 5 of the application. As such, it is suggested that "and the other end of said conduit is connected to said device supply stream output" be deleted from claims 1 and 6.

Claim Rejections - 35 USC § 103

6. Claims 1-3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voss et al (U.S. Patent 6,106,964) in view of Lovelock (U.S. Patent 5,160,511).

Voss et al. is directed to a fuel cell system comprising a fuel cell having anode and cathode inputs and outputs (see Fig. 2). A water transfer device (400) is connected to the fuel cell that

transfers water from either of the cathode or anode exhaust streams to either of the supply streams (see col. 9, lines 30-35; col. 7, lines 25-31). The water transfer device comprises a poly[perfluorosulfonic] acid membrane (see col. 5, lines 47-53). The anode supply stream may comprise reformate produced by a fuel processor (see col. 15, line 46). The temperature of the cathode effluent at the device inlet would inherently not be significantly greater than the temperature of the cathode effluent at the cathode output.

Voss et al. do not expressly teach that the temperature at the device input is sufficient to maintain water in its vapor state and being up to 10 degrees above the dew point of the cathode effluent, as recited in claim 1. The reference further does not teach the structural details of the water transfer device as recited in claim 1.

Lovelock teaches a water vapor transfer module comprising plenums connected to conduits through which a wet gas flows, and a housing surrounding the conduits and through which a dry gas flows.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the module of Lovelock in the system of Voss et al. In column 1, line 29, Lovelock teaches that with regard to his invention, "the lithium polymer is not only more stable to heat but also neutral and less likely to react with labile compounds or catalyse their decomposition." It is further taught in column 2, line 32 that "apparatus of the illustrated form has been found to work well and survive at 100°C, and to dry steam-saturated nitrogen or other gases at this temperature." As such, the artisan would be motivated to use the module of Lovelock in the system of Voss et al.

Further, the artisan would be motivated to maintain the cathode effluent of Voss et al. at a sufficient temperature and pressure so as to avoid condensing any of the water inside the water transfer device. As noted by Lovelock, the device may be operated at temperatures up to 100°C and is capable of drying steam-saturated gases. As such, the artisan would be motivated to operate the apparatus of Voss at temperature(s) sufficient to maintain water in its vapor state so as to use the apparatus of Lovelock for its intended purpose.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Voss et al. in view of Lovelock as applied to claims 1-3 and 5 above, and further view of Bloomfield (U.S. Patent 3,976,507).

Voss et al. do not expressly teach that the fuel is reformed by an autothermal reformer.

The patent of Bloomfield is directed to a fuel cell system comprising an autothermal reformer (see Fig. 1).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of Bloomfield to use an autothermal reformer in the system of Voss et al. In column 2, line 45, Bloomfield teaches that the autothermal reactor is advantageous because it "does not require a separate burner to supply heat." Therefore, the artisan would be motivated to use an autothermal reformer in the system of Voss et al. in order to make more efficient use of heat.

8. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voss et al. in view of Lovelock as applied to claims 1-3 and 5 above, and further view of JP 6-333583.

Regarding claim 6, Voss et al. further teach in column 15, line 48 that "in conventional operation, the compressed air was humidified prior to entering the fuel cell by first flowing it through a cross-flow membrane humidifier."

However, Voss et al. do not expressly teach that the air is compressed *after* humidification, as recited in claim 6.

JP 6-333583 is directed to a fuel cell system comprising a compressor (42) downstream of a cathode supply line humidifier (43; see Fig. 1).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of the Japanese reference to position the compressor in the system of Voss et al. downstream of the humidifier. In paragraph [0025] of the machine translation, the Japanese reference teaches that this configuration results in less evaporation of the moisture from the polymer electrolyte film. Accordingly, the artisan would be motivated to move the compressor in the system of Voss et al. to a position downstream of the humidifier.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Voss et al. in view of Lovelock and JP 6-333583 as applied to claims 6-8 above, and further in view of Bloomfield.

Voss et al. do not expressly teach that the fuel is reformed by an autothermal reformer.

As noted above, the patent of Bloomfield is directed to a fuel cell system comprising an autothermal reformer.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of Bloomfield to use an autothermal reformer in the system of Voss et al. In column 2, line 45, Bloomfield teaches that the autothermal reactor is advantageous because it "does not require a separate burner to supply heat." Therefore, the artisan would be motivated to use an autothermal reformer in the system of Voss et al. in order to make more efficient use of heat.

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 1-9 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 6,630,260 in view of

Lovelock and JP 6-333583. The claims of the '260 patent recite a configuration wherein a water transfer device transfers water from an effluent to a supply stream. The claims do not recite the dew point ranges recited in the instant claims, the structure of the water transfer device, or the presence of a compressor. However, these limitations would be rendered obvious in view of Lovelock and JP '583 for substantially the same reasons set forth above. As such, the instant claims are considered to define an obvious variation of the '260 patent claims.

Response to Arguments

12. Applicant's arguments filed July 21, 2005 have been fully considered but they are not persuasive. Applicants assert that "Voss teaches the reverse arrangement of claim 1 of the present invention" with regard to the temperature of the cathode effluent at the device inlet. Specifically, it is asserted that "Voss et al. teaches in Figure 2 and at columns 9 and 10 that the combination heat and humidity exchanger module 400, which contains CHHE membrane 410, is in direct heat transfer with fuel cell stack 300. By this arrangement, the cathode exhaust from the stack is further heated by its position in heat transfer relationship with stack 300." However, it is first noted that Voss teaches at col. 10, line 16 that "CHHE module 400 *may* be placed in direct thermal contact with fuel cell stack 300" (emphasis added). As such, it is seen that Voss does not require the CHHE to be directly adjacent the fuel cell. Further, as is shown in Figure 2, the cathode exhaust (stream 340) would not have a significant change in temperature from the exit point of the fuel cell to the inlet point of the CHHE. If anything, the cathode exhaust stream would *lose* heat due to piping and friction losses. As such, Voss is still

considered to meet the limitation in claim 1 that "the temperature of said cathode effluent at said device cathode effluent input is not significantly greater than the temperature of said cathode effluent at said cathode output." Regarding the arguments directed to GB '110 (Dantowitz) and the structure of the water transfer device, these arguments are believed to be moot in view of the new ground of rejection set forth above.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jonathan Crepeau
Primary Examiner
Art Unit 1746
September 27, 2005

FORM HDP-1449 (Based on Form PTO-1449)

PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE CITATION

(Use several sheets if necessary)

Sheet 1 of 1

ATTORNEY DOCKET NO.	SERIAL NO.
8540G-000086/COB	10/627,145
APPLICANT	
Jameson R. Forte et al.	
FILING DATE	GROUP
7/25/2003	1746

U.S. PATENT DOCUMENTS

Ref. Desig.	Examiner's Initials	Document Number	Date	Name	Class/ Subclass	(If appropriate) Filing Date
1.	JV	5,360,679	11/1/1994	Buswell et al.	—	

FOREIGN PATENT DOCUMENTS

Ref. Desig.	Examiner's Initials	Document Number	Date	Country	Class/ Subclass	Translation Yes	No
1.							

OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, etc.)

Ref. Desig.	Examiner's Initials	
1.		

Examiner: J. F. Date Considered: 9/27/05

EXAMINER: Please initial if citation considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Notice of References Cited	Application/Control No. 10/627,145	Applicant(s)/Patent Under Reexamination FORTE ET AL.	
	Examiner Jonathan S. Crepeau	Art Unit 1746	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,160,511	11-1992	Lovelock, James E.	95/52
	B	US-			
	C	US-			
	D	US-			
	E	US-			
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.